

1. A method of optimizing a cycle time of a liquid dispensing module, comprising:

- providing a liquid dispensing module having a dispenser body capable of receiving and discharging a flow of the liquid and a pneumatic actuator, the
- 5 dispenser body including a flow-control mechanism having a first condition in which the flow of the liquid is discharged from the dispenser body and a second condition in which the flow of the liquid is blocked, the pneumatic actuator having an air piston housing containing an air cavity, an air piston located in the air cavity, and a solenoid valve capable of controlling the flow of pressurized air
- 10 to and from the air cavity for alternatively applying an actuation force to the air piston and removing the actuation force from the air piston, the air piston operatively coupled with the flow-control mechanism for providing the first condition when the actuation force is applied and the second condition when the actuation force is removed, the air cavity having an initial air volume and the
- 15 pneumatic actuator having an effective valve flow coefficient;
- specifying a first value for one of the initial air volume and the effective valve flow coefficient; and
- determining a second value of the other of the initial air volume and the effective valve flow such that the cycle time is less than or equal to 9
- 20 milliseconds.